PATHFINDER

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An informal newsletter to the GPS User Community produced by Army PM GPS, Fort Monmouth, NJ. Information presented is based on published and submitted news items of interest to the general user. Widest dissemination and reproduction is encouraged and newsworthy items are solicited for inclusion. Editor Mr. Don Mulligan at PM GPS, Ft Monmouth NJ DSN 992-6137 or (732) 532-6137 or email: **Donald.Mulligan@mail1.monmouth.army.mil**

The Pathfinder can be found on-line at: http://army-gps.robins.af.mil

PM Corner

Hello GPS Users!

Here at the Joint Program Office (JPO) we continue to work on the DAGR program to bring the next generation of GPS receivers to the Army, starting in FY03. Of more immediate concern to you, I recommend you take stock of your unit's requirement for portable power in light of the ongoing supply problems with the BA-5800 battery. Consider your alternatives for training and be prepared for deployment. Also, remember that the President's recent direction to "turn off" S/A did not alter the requirement that military units operate Precise Positioning Service (PPS) rated GPS equipment. In fact, PPS sets are more critical than ever for the reasons discussed in an article in this newsletter. Finally, I invite you to share questions or comments. I can't help you if you don't contact me, so please let one of the Army GPS offices hear from you.

LTC Eveland

PLGR Vehicle Installations: A Good Ground is Needed.

PLGR vehicle installations were discussed at length in our last issue. A specific question about the ground wire has arisen, as to whether the negative lead of the PLGR external power cable should be connected directly to the vehicle battery or to a point on the vehicle chassis. The preferred location is the negative battery terminal. If the vehicle has two batteries in series, connect to the negative terminal of the battery that is connected to the chassis. This eliminates the possibility of any voltage potential between the PLGR ground and the battery. If it is not possible to ground the PLGR at the battery, a connection to a chassis ground is acceptable but be sure there is a secure, clean metal to metal connection to the chassis. Test this location with a meter to be certain that it has a low resistance path back to the battery terminal. This is necessary for proper PLGR performance and to eliminate certain safety concerns.

There are two other safety concerns for PLGR vehicle installations. First, correct polarity connection of the PLGR external power cable is important. The PLGR negative external power lead is the one that does not have the in-line fuse. Second, a BA-5800 battery should never be in a PLGR while it is connected to external power.

Michael Wilkin

Updating the PLGR Soldiers Guide

We plan to update the PLGR Soldiers Guide (TB 11-5825-291-10-2) this Fall. Here are some frequent recommendations. If you have an idea, contact us before 1 Sep!

Summary of information about battery safety based on all the Safety of Use messages issued about PLGR batteries.

Overview on installing PLGR to common wheeled vehicles.

An index to cross-reference content better so we can look up topics faster.

An overview of Army maintenance policy for PLGR.

Don Mulligan and Willie Jackson

Updating the PLGR Technical Manual

Army TM 11-5825-291-13
USAF TO 31R4-2PSN11-1
Navy EE 174-AA-OMI-010/PSN-11
USMC PCN 60000282000

The Joint Service PLGR Technical Manual (TM 11-5825-291-13) is being reviewed for possible changes. The Georgia Field Office (GFO) is now collecting input for Change 3. (Change 1 was dated 9 Jun 96 and Change 2 was dated 26 Nov 97). If you have any suggestions please submit them immediately to the GFO for consideration.

Note: The PLGR TM was out of stock at the Army Publication Center for a while but a new printing has recently been delivered. Since the PLGR TM is actually managed by the USAF, you can order the same document through the USAF using the TO number listed above. (Have your unit publication custodian contact the GFO to get instructions on establishing a USAF publications account).

Johnny Walker

Why can't we get the additional PLGR we are authorized in our unit?

The Army purchased the maximum number of PLGR available on the original contract. But unit equipment authorizations grew to an even higher number so there is a shortfall of PLGR in the Army. The "get well" action is to wait until fielding of DAGR, the next generation handheld receiver, begins in FY03. As the DAGR is fielded, PLGR will be collected and re-issued to back-fill lower priority units that are short PLGR. It will take several years but eventually, high priority Army units will operate with DAGR and other units will have a full issue of PLGR authorizations.

Olga Lawrence

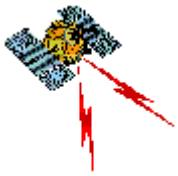
Disposition on older GPS equipment:

Do you have a SLGR or an ITS-B in the storeroom? SLGR is the AN/PSN-10 Small Lightweight GPS Receiver bought during Desert Storm and since replaced by PLGR. Any SLGR should be sent to BAE Systems, Building 91302, Attention Steve Robinson, Fort Huachuca, AZ 85613. DODAAC C1GMPK. Call Steve at (520) 538-2877 for further assistance. ITS-B is the AN/GSM-336(V) Intermediate Test Set. It was used to support the AN/ASN-149 GPS receiver in CH-47D aircraft but that support role ended when CH-47D converted to another GPS system. The ITS-B Item Manager at CECOM is Mr. Walter Coffing at (732) 532-9155. He asks aviation maintenance units to turn in those ITS-B sets since they are needed to support other aircraft using the AN/ASN-149.

NSNs for SLGR:	5825-01-356-7849 5825-01-357-5506 5825-01-357-6170
NSN for ITS-B:	V2 6625-01-294-1941 V4 6625-01-347-1757

Joe Meskill and Mike Carr

GPS Satellites, Out of Sight, Out of Mind?



Here's an update on the part of the GPS system that you can't see but can't live without, the satellites. Twenty-eight operational satellites provide uninterrupted worldwide GPS service. However, 16 of these "birds" are getting old so the Joint Program Office (JPO) is scheduling launches to replace them one by one. A current model GPS satellite costs $42M and weighs about 4,500 lbs.

Also, solar activity is expected to peak during 2000. This may generate electromagnetic atmospheric effects on radio signals passing through the earth's ionosphere, including GPS signals. In the worst case, this interference could result in the loss of lock on a satellite signal. Most of this interference will occur around the equator and the polar caps. If a specific period is identified for high solar activity, a notice will be posted on the GPS website. In most cases, any solar activity interference will only last for a brief period.

Del Crane/Jim Buggy

Update on PLGR Repair/Warranty

Rockwell Collins in Cedar Rapids, Iowa is the exclusive repair facility for all PLGRs bought by the Department of

Defense. See the PLGR TM, section 8.2 (Change 2) for the current address and procedures for returning unserviceable PLGRs for repair.

Each PLGR has a warranty label stating the date of warranty expiration. Some users have asked, "How do I get a PLGR fixed if this date has passed?" Answer: Follow section 8.2 instructions even if the warranty date has passed!

The government recently signed a contract with Rockwell Collins to extend warranty coverage for PLGR repair! Army and Air Force PLGRs now have 4 more years on their warranty life.

The impact to you? The contract means Rockwell will be honoring the 5 day Turn-Around-Time for warranty replacements so you are more likely to get your replacement in a timely manner. We sought this extension to enable us to provide better support to you in turn-around time, to manage life cycle costs of the program and to be able to work other repair issues such as possible obsolete parts. If you have a question about the PLGR warranty program or status of PLGR you've sent in for repair, contact the Georgia or New Jersey offices.

Diana Wright, Warner Robins, GA

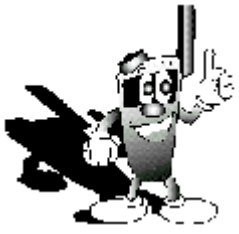
AN/PSN-11 PLGR Repairs Authorized at the Unit Level

From 1 Jan 00 – 31 Mar 00, approximately 11% of PLGRs were returned for battery cap replacement. Change 2 to the PLGR TM (TM 11-5825-291-13, dated 26 Nov 97) authorizes repairs that can be accomplished in the field. You are authorized to replace the following external components:

ITEM	NSN	Price (Dec 99)
Memory Battery Cap assembly	5340-01-449-1033	$32.03
J2/J3 Connector cover mudflap	5340-01-449-1045	$90.48
J4 connector cover mudflap	5340-01-449-1036	$15.53
Prime Battery cap assembly	5340-01-449-1029	$39.78

Over-tightened the prime battery cap and crack it? Or maybe you lost the memory battery cap or the connector mud flaps came unglued and disappeared. No problem, you can replace these parts. And since these items are not covered by the warranty, your local repair work will avoid the base fee of $255 charged for any non-warranty repair. Check out the instructions in Section 8.1.4 of Change 2 to the PLGR TM. Part numbers are listed in Appendix F in Change 2. NOTE: Once the tether on the prime battery cap is cut, it does not get replaced, so if you install a replacement, there will be no strap connecting it to the PLGR. If further information is required, contact Georgia or New Jersey offices.

Ed McAuley



One More Time! PLGR Reprogramming?

Our campaign to reprogram PLGR is now one year old. Most field units have completed the

process and reported their serial numbers. If you are one of the "holdouts" who still doesn't operate with software version 613-9854-003 or 613-9544-008 (Software version is displayed on start-up) then contact us for the loan of a PLGR reprogramming kit without delay. Call Darlene Phillips at DSN 992-8406 or email her at **Darlene.Phillips@mail1.monmouth.army.mil**

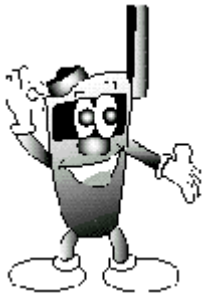
Darlene Phillips

AN/PSN-11 & (V)1 PLGR Failure Description

PLGR is a durable product but with over 84,000 systems in DoD use, there's going to be a certain amount of field damage. During the second quarter of FY00, 2049 PLGRs were returned for repair. Of these, 27% did not include any description of the problem or circumstances leading to the problem. This lack of information slows the diagnosis and repair process. When returning a PLGR IAW TM, section 8.2 (Change 2), please do the following:

Provide a problem description and/or fault codes.

Ed McAuley



PLGR Return OKs (RTOKs)

During Sep 99 – Mar 00, a high number of PLGRs were returned with nothing wrong with them, i.e. Return OK (RTOK). The most common complaints include "Unit will not turn on" or "Unit will not turn off." These issues have been addressed in previous PATHFINDER articles, for example: If a PLGR that won't turn on, it may be a case of passivated contacts in a battery that has been on the shelf for a while. If a PLGR won't turn off, you may have inadvertently activated the Automark feature. Another source of trouble is trying to load an out-of-date crypto key – which the PLGR usually won't accept.

Before returning a "defective" PLGR with any of these symptoms, verify the fault by reviewing the PLGR Technical Manual or contacting your CECOM LAO. If efforts to clear the fault are unsuccessful or the failure is intermittent, document the problem and return the PLGR for repair.

Ed McAuley

Is there really a difference between commercial and military GPS?

Over 25 years ago, the radio signal navigation programs of the USAF and Navy combined to form the GPS Joint Program Office (JPO). The mission of the JPO was to develop a satellite-based navigation system to meet the requirement of US military forces for a global 3-dimensional all-weather navigation system.

Early on, the US Government recognized that a system beaming radio signals across the entire planet had potential for both civilian and military use, hence the title "Dual Use Technology." The JPO designed the GPS program to provide two levels of service, STANDARD positioning service (SPS) for civilian users and PRECISE positioning service (PPS) for military users. SPS provided a "reasonable" level of accuracy and PPS a more precise level of accuracy for authorized users. (After all we

didn't want adversaries to have the ability to use commercial GPS to target our forces with pinpoint accuracy.)

By 1990 there were enough satellites in orbit to make full time use of GPS a reality. This coincided with Operation Desert Storm where GPS gained fame by allowing Coalition forces to navigate the featureless desert. The favorable press from Desert Storm opened the floodgates to commercial use of GPS.

Manufacturers began promoting many civilian uses of GPS and soon the number of civilian users outnumbered the number of military users. One of the most critical commercial applications of GPS is as a navigation aid for civil aviation. The FAA and its international counterparts are making GPS a required element of Global Air Traffic Management. GPS is already used for non-precision approaches and will soon be relied upon for precision landings and air traffic collision avoidance.

Today, many civil uses of GPS proliferate. When television commercials promote automobile navigation and assistance systems, GPS is being used to determine the vehicle location. And if you fish or hike you've seen the pocket-sized GPS receivers offered at sporting goods stores. Many civil users have pressured the government to improve the accuracy of the commercial signal.

So when President Clinton recently directed that Selective Availability (SA) be turned off, did he make civil and military GPS systems equal? No! His action improved the accuracy of the peacetime commercial signal but he also directed the military to retain options for controlling GPS during hostilities. The military will use a new strategy to control access to precision GPS. Instead of affecting the signals at origin on the satellite (as SA did), we will now use external systems to influence the signal in a designated Area of Operations. Military users with PPS sets in that AO will do just fine, but civil sets attempting to use SPS signals in that AO will get inaccurate information, if any at all.

In the future, GPS will continue to serve many practical peacetime uses. At the same time, the military will retain the option to block the use of the signal in a designated area during hostilities. Military units must remain prepared to operate in that compromised signal environment through the use of keyed PPS sets.

Frank Rowe and Del Crane

Q: We've ordered BA-5800 batteries for PLGR and have been told they are not available. What's going on and what alternatives do we have?

It is true that the supply of the BA-5800 battery is limited. Back-orders can be expected to persist until sometime next year. The CECOM Item Manager is getting monthly deliveries of new batteries but is using them to fill high priority requisitions. The delivery rate will increase later this year and eventually all back orders will be filled. If a field unit has a critical mission and needs this battery, they should submit a new requisition for a low quantity using the highest priority.

Another source of requisition trouble might be the NSN: In 1998 it changed from 6665-99-760-9742 to 6135-01-440-7774. Requisitions using the old NSN should convert to the new NSN. When you order the new NSN, you are buying 8 batteries per package instead

of individual batteries. This NSN change will be in Change 3 to the PLGR TM, to be published later this year.

Based on overall cost and performance, we recommend the AA insert sleeve with eight (8) AA alkaline cells as an alternative to the BA-5800. For the same mission duration, alkaline AA cells will cost about half what you spend for a BA-5800 and when you are done, there is no hazardous material to dispose of. The disadvantage is that you'll have to change out the AA cells 4 or 5 times to equal the duration of a BA-5800. You can compensate for this by having at least one spare insert pre-loaded with AA cells in your ruck sack.

Order: ITEM	NSN
Battery Holder, AA insert	6160-01-385-4358
AA alkaline batteries (pkg of 24)	6135-00-985-7845

Jeanne Monahan

Q: What About Rechargeable Batteries?

As first discussed in our Jan 99 issue, CECOM is developing a rechargeable battery that will fit PLGR in place of the BA-5800 battery. CECOM is also developing several recharging alternatives for this battery so you will have options on how and when to recharge it. CECOM estimates this new battery system will be available sometime next year.

Currently there are three approved rechargeable alternatives but we do not endorse them due to their cost and marginal gain over alkaline AA cells. One is the use of "Ni-Cad" rechargeable AA cells. A second is the use of "renewable" AA cells. The problem here is that you pay a lot for a marginal gain in performance over alkaline cells and you introduce the risk of accidentally mixing battery types. When using the AA insert, the batteries should be of the same chemistry and age. If they aren't, you risk erratic voltage and damage to PLGR. Pay particular attention to keeping the 3.6 volt PLGR AA size memory battery away from the batteries you use in the AA insert for main power. Using the memory battery (NSN 6135-01-301-8776) in the main power chamber is a definite "no-go."

AA rechargeable "renewable" and "NiCad" batteries:

ITEM	NSN
AA rechargeable "NiCad" battery:	6140-00-449-6001
Recharging stand for NiCads:	6130-01-225-9554
AA rechargeable "renewable" battery:	6140-01-380-9981
Recharging stand for renewables:	6130-01-381-0827

The third rechargeable option is the large Ni-Cad battery specially designed for the PLGR. This battery is automatically recharged when used in a PLGR connected to external power. If that's not practical, you can purchase external recharging stands from the vendor. This battery is available through supply or direct from the vendor, but the custom recharging stands are only available direct from the vendor.

Large NiCad Rechargeable:	6140-01-400-2902

Custom Recharging Stand

Large battery Recharging stand:	Rockwell Collins Part #	Cost
For one battery:	270-2547-040	$206
For three batteries:	270-2547-050	$469
For six batteries:	270-2547-060	$581

(Note: These are only available direct from Rockwell – call 1-800-321-2223. Outside the USA call 319-295-5100.)

Don't spend the money for these rechargeable battery systems if the use of alkaline AA cells will meet your need, especially for training. Learn more about rechargeable batteries by contacting Don Brockel at DSN 992-4948 or by visiting the website at: http://www.monmouth.army.mil/cecom/lrc/lrchq/power/rechargebat.html

Michael Wilkin and Don Brockel

Q: I saw a recent Ground Precautionary Message (GPM) advising us to remove certain BA-5800 batteries from field stock. Is this the same message as previous GPMs on this battery?

Yes, this is a consolidation and re-issue of the notice that went out in several different GPM and Safety of Use Messages (SOUM) over the past few years. Most of these batteries were removed from government depot stock in response to the initial GPM and SOUM, but some field units already had the batteries and are still using them, especially since newer safer batteries are in short supply. The batteries identified in the GPM constitute a danger to the soldier so CECOM has re-issued the guidance to remove them from field use. Units are urged to get a copy of the latest GPM and follow the guidance to identify and remove from stock any batteries identified in the GPM. **These batteries are unstable and soldiers have been injured.** Be sure to follow the specific instructions concerning disposal. Contact your CECOM LAO or safety office for a copy of CECOM GPM 2000-002 or any of the previous messages (listed below).

Michael Wilkin

CECOM Ground Precautionary Messages (GPM) and Safety Of Use Messages (SOUM) on Lithium Sulfur Dioxide Batteries:

These messages have carried advice on proper use, storage and disposal of lithium batteries and a specific warning to remove certain batteries produced by Ballard from field use. Copies should be available through your CECOM LAO.

GPM 99-002
SOUM 98-001
SOUM 97-017
GPM 96-011

Mr. David Kiernan, DSN 992-0084, EXT. 6447

Refused Mail Deliveries

Postal authorities at a military installation recently blocked mail deliveries that did not include a street address. Don't let this happen to you. If your installation is enforcing this requirement, be sure to send Change of Address notifications to senders including Pathfinder otherwise your newsletter will be returned to us. Once returned, we delete your address from our list.

Provide address changes to the editor at Fort Monmouth by mail, phone or email.

Don Mulligan

How to Contact PM GPS

For Field Assistance

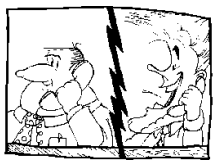
There is a GPS help line at all three PM GPS locations.

PM GPS consists of divisions located in California, Georgia and New Jersey under the direction of LTC Eveland who is located at the Los Angeles Air Force Base. An email address is provided for each location. Email sent to any of these contacts will be forwarded to the right person or office for reply.

For PM GPS and the Technical Management Division (TMD) at Los Angeles, CA
Call (310) 363-0595 or DSN 833-0595.
E-mail:
del.crane@LOSANGELES.AF.MIL
Or Chuck Pocher at DSN 833-2712

For the Georgia Field Office (GFO) at Warner-Robins, GA
Call (912) 926-3288 or DSN 468-3288.
E-mail:
johnny.walker@ROBINS.AF.MIL
Or Frank Rowe at DSN 468-9511

For the Readiness Management Division (RMD) at Fort Monmouth, NJ
Call (732) 532-4733 or DSN 992-4733.
E-mail:
james.buggy@mail1.monmouth.army.mil
Or Michael Wilkin at DSN 922-6131



Who to call

For new technical installation advice, new product information (SAASM, DAGR) technical test reports and acquisition support planning, call TMD.

For sustainment management including software support, supply support, technical publications and accessory procurement, call GFO.

For fielding, equipment authorizations, host vehicle installation assistance and New Equipment Training, call RMD.

How to contact contributors to this issue:

Don Brockel
Donald.Brockel@mail1.monmouth.army.mil

Jim Buggy
James.Buggy@mail1.monmouth.army.mil

Mike Carr
Michael.Carr@mail1.monmouth.army.mil

Del Crane
Del.Crane@LOSANGELES.AF.MIL

Willie Jackson
Willie.Jackson@robins.af.mil

David Kiernan
David.Kiernan@mail1.monmouth.army.mil

Olga Lawrence
Olga.Lawrence@mail1.monmouth.army.mil

Ed McAuley
Edward.mccauley@mail1.monmouth.army.mil

Joe Meskill
Joseph.Meskill@mail1.monmouth.army.mil

Darlene Phillips
Darlene.Phillips@mail1.monmouth.army.mil

Johnny Walker
Johnny.Walker@robins.af.mil

Michael Wilkin
Michael.Wilkin@mail1.monmouth.army.mil

Diana Wright
Diana.Wright@robins.af.mil

PATHFINDER

PM GPS
Attn: AMSEL-DSA-GPSR
Squier Hall
Fort Monmouth, NJ 07703

ACCT #89

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